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Cost of Capital Study

January 1, 2016

Staff Recommendation

Industry: Railroad Industry - Class I			SIC: 4002
Equity:			Reference
Risk Adjusted Models			
	CAPM	11.09%	Page 5
Dividend Growth Models			
	DGM or DCF Model (Dividend Growth)	10.50%	Page 7
	DGM or DCF Model (Earnings Growth)	10.25%	Page 7
	DGM or DCF Model (b * ROE = Growth)	15.00%	Page 7
Estimated Cost of Equity Capital		13.00%	
Debt:			
Estimated Cost of Debt Capital		5.50%	Page 3
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Cost of Capital Summary			
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Capital Component	Market Capital Structure	Cost of Capital	Before-Tax Weighted Average Cost of Capital
Debt	19.00%	5.50%	1.05%
Equity	81.00%	13.00%	10.53%
TOTAL	100.00%		11.58%
		Rounded	11.50%

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Staff Recommendation

Industry: Railroad Industry - Class I			SIC: 4002
Equity:	Direct Rate		Reference
	Estimated Cost of Equity Capital	5.26%	Page 8
Debt:			
	Estimated Cost of Debt Capital	3.32%	Page 9
Cost of Capital Summary			
Capital Componer	Market Capital Structure	Cost of Capital	Before-Tax Weighted Average Cost of Capital
Debt	19.00%	3.32%	0.63%
Equity	81.00%	5.26%	4.26%
TOTAL	100.00%		4.89%
		Rounded	5.00%

Cost of Capital Study
January 1, 2016
Analysis of the Market Capital Structure
Analysis of Debt Capital

Industry: Railroad Class I		Ratings	
Company	Ticker	Moody's	S&P
Can. National Railway	CNI	A2	A
Can. Pacific Railway	CP	Baa1	BBB+
CSX Corp.	CSX	Baa1	BBB+
Kansas City Southern	KSU	Baa3	BBB-
Norfolk Southern	NSC	Baa1	BBB+
Union Pacific	UNP	A3	A
Overall Average Debt Rating		Baa	BBB

NR = Not Rated

Mergent Bond Record, Jan 2016, Page 208				
Corporate	Aaa	Aa	A	Baa
October	3.95%	4.11%	4.33%	5.34%
November	4.06%	4.21%	4.43%	5.46%
December	3.97%	4.16%	4.38%	5.46%
Average	3.99%	4.16%	4.38%	5.42%
Public Utilities				
	Aaa	Aa	A	Baa
October		4.13%	4.29%	5.47%
November		4.22%	4.40%	5.57%
December		4.16%	4.35%	5.55%
Average		4.17%	4.35%	5.53%
Industrials				
	Aaa	Aa	A	Baa
October	3.95%	4.08%	4.37%	5.21%
November	4.06%	4.20%	4.45%	5.34%
December	3.97%	4.16%	4.40%	5.36%
Average	3.99%	4.15%	4.41%	5.30%
Debt Yield Rate Estimate:		5.50%		

Ratings Dispersion & Averages			
Agency	Number of Companies		
S&P			
AAA	1		
AA	2		
A	3	2	6
BBB	4	4	16
BB	5		
B	6		
CCC	7		
C	9		
D	10		
Total:		6	22
Average Rating:			3.67
Moody's			
Aaa	1		
Aa	2		
A	3	2	6
Baa	4	4	16
Ba	5		
B	6		
Caa	7		
Ca	8		
C	9		
Total:		6	22
Average Rating:			3.67

Cost of Capital Study
January 1, 2016
Analysis of the Market Capital Structure

Industry: Railroad Class I								SIC: 4002
Company Name	Stock Symbol	Debt (\$ mil)	Debt %	Stock Price	Shares Outstanding	Equity (\$ mil)	Equity %	Total Capital (\$ mil)
Can. National Railway	CNI	6,469.0	11.80%	61.40	787.2	48,334	88.20%	54,802.8
Can. Pacific Railway	CP	6,427.0	20.51%	162.76	153	24,902	79.49%	31,328.6
CSX Corp.	CSX	10,683.0	26.20%	31.17	965.5	30,099	73.80%	40,781.7
Kansas City Southern	KSU	2,045.0	16.24%	97.19	108.5	10,545	83.76%	12,589.6
Norfolk Southern	NSC	9,393.0	25.56%	91.88	297.8	27,362	74.44%	36,755.2
Union Pacific	UNP	13,607.0	13.98%	98.61	849.2	83,741	86.02%	97,347.7
Totals		48,624.0				224,982		273,605.6
Weighted Mean			17.77%				82.23%	
Mean:		8,104	19.05%			37,497	80.95%	78,173
Median:			18.38%				81.62%	
Market Capital Structure Estimate:		Debt:	19.00%			Equity:	81.00%	

Stock Price = 2015 Average Closing Price

Data Source: Value Line Investment Survey

Cost of Capital Study
January 1, 2016
Capital Asset Pricing Model (CAPM)

$$\text{CAPM} \Rightarrow K_e = R_f + (\beta * \text{ERP})$$

Industry: Railroad Class I	SIC: 4002
Risk-Free Rate (R_f)	3.50%
Beta (β)	1.10
Equity Risk Premium (ERP): ($R_m - R_f$)	6.90%
Adjusted Equity Risk Premium: ($\beta * \text{ERP}$)	7.59%
Cost of Equity Capital - CAPM	11.09%
Morningstar SBBI Presentation 1926 - 2015	
Long-Term Government Bonds - Income Return ¹	5.00%
Intermediate Term US Treasury Coupon Note Yield (5-Year) ¹	4.50%
Short-Term US Treasury Bill Yield (30-Day) ¹	3.50%
Long-Term Horizon Expected Equity Risk Premium ² (Large Compay Stock Total Return - Long-Term US Government Bond Income)	6.90%
¹ SBBI Summary Statistics of Annual Returns (1926-2015), Arithmetic Mean, p. 6	
² Building Blocks for Expected Return Construction (1926-2015), p. 7	
Federal Interest Rates - IRS.gov, January 2016 Weighted Average Rates	
Long Term Treasury (30 year) ¹	3.12%
Composite Corporate Bonds ²	4.32%
¹ http://www.irs.gov/Retirement-Plans/Weighted-Average-Interest-Rate-Table	
² http://www.irs.gov/Retirement-Plans/Composite-Corporate-Bond-Rate-Table	
The ValueLine Investment Survey, Selected Yields, Page 3821, January , 2016	
U.S. Treasury Securities:	
5-year	1.79%
10-year	2.31%
30-year	3.04%
30-year Zero	3.17%
Federal Reserve Statistical Release (http://www.federalreserve.gov/Releases/H15/20160104/) 1/2016	
Treasury constant Maturities:	
5-year	1.78%
10-year	2.29%
20-year	2.66%
30-year	3.01%
Risk-Free Rate of Return R_f Estimate:	3.50%

Cost of Capital Study

January 1, 2016

Beta (β) Analysis

Industry: Railroad Class I		SIC: 4002
Company Name	Stock Symbol	Beta " β "
Can. National Railway	CNI	1.00
Can. Pacific Railway	CP	1.15
CSX Corp.	CSX	1.20
Kansas City Southern	KSU	1.20
Norfolk Southern	NSC	1.05
Union Pacific	UNP	1.05
Mean:		1.11
Median:		1.10
Beta (β) Estimate:		1.10

NMF = Not Meaningful

Data Source: Value Line Investment Survey

Cost of Capital Study
January 1, 2016
Dividend Growth Model (DGM or DCF)

$$\text{DGM or DCF Model} \Rightarrow K_e = \frac{D_1}{P_0} + g$$

where
 K_e = Cost of Equity
 D_1 = Expected Dividends
 P_0 = Current Price
 g = Sustainable Growth

Industry: Railroad - Class I												SIC: 4002
Company Name	Stock Symbol	Stock Price P_0	Expected Dividend D_1	Dividend Yield (D_1 / P_0)	Dividend Growth g	Earnings Growth g				(Dividends) K_e	(Earnings) K_e	$g=(b * ROE)$ K_e
							b	ROE	$g=(b * ROE)$			
Can. National Railway	CNI	61.40	1.08	1.76%	10.00%	6.50%	72.18%	23.94%	17.28%	11.76%	8.26%	19.04%
Can. Pacific Railway	CP	162.76	1.01	0.62%	9.00%	11.50%	86.07%	33.88%	29.16%	9.62%	12.12%	29.78%
CSX Corp.	CSX	31.17	0.72	2.31%	8.00%	7.00%	65.14%	16.86%	10.98%	10.31%	9.31%	13.29%
Kansas City Southern	KSU	97.19	1.32	1.36%	10.50%	10.00%	71.66%	12.67%	9.08%	11.86%	11.36%	10.44%
Norfolk Southern	NSC	91.88	2.36	2.57%	4.00%	7.00%	54.18%	12.76%	6.91%	6.57%	9.57%	9.48%
Union Pacific	UNP	98.61	2.20	2.23%	9.50%	8.50%	50.15%	22.71%	11.39%	11.73%	10.73%	13.62%
Mean:				1.56%	9.00%	8.33%	74.46%	24.89%	19.14%	10.31%	10.22%	15.94%
Median:				1.76%	9.00%	7.00%	72.18%	23.94%	17.28%	11.02%	10.15%	13.46%
Cost of Equity Capital - DCF K_e Estimate:										10.50%	10.25%	15.00%

NMF = Not Meaningful

b = (1 - payout ratio) = Retention Ratio

ROE = Return on Book Equity

Stock Price = 2015 Average Closing Price

Data Source: Value Line Investment Survey

Support for Market Multiples
Railroad - Class I
2016 Assessment Year

Industry Overall				
Company Name	Ticker	\$Stock\$ Average	Earnings	P/E Multiple
Can. National Railway	CNI	61.40	3.2	19.19
Can. Pacific Railway	CP	162.76	7.27	22.39
CSX Corp.	CSX	31.17	2	15.59
Kansas City Southern	KSU	97.19	4.5	21.60
Norfolk Southern	NSC	91.88	5.11	17.98
Union Pacific	UNP	98.61	5.41	18.23
Mean:				19.16
Median:				18.71
Weighted Mean:				19.75
P/E Estimate:				19.0
Equity Rate:				5.26%

NMF = Not Meaningful

Stock Price = 2015 Average Closing Price

Note: Units per share comparisons

Data Source: ValueLine Investment Survey

Cost of Capital Study
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Direct Debt Rate Calculation

Industry: Railroad		
Direct Capitalization Debt Rate		
Interest Expense		\$ 1,616.0
Total Value of Debt (TVD)		\$ 48,624.0
Current Yield = Interest Expense/TVD		3.32%

\$ (millions)

Data Source: ValueLine Investment Survey